EXTERNAL REVIEW
OF THE MANITOBA CARDIAC CARE SERVICES

AUGUST 18, 2003

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...

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...

(l) the individual's own personal views or opinions, except if they are about another person,

(m) the views or opinions expressed about the individual by another person, ..."

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The Review Team would also like to thank the patients, family members of patients and members of the general public who took the time to be interviewed or submit written submissions. While the actual number of individuals who responded to the public advertisements soliciting input was relatively small, those that did provide input were candid, thoughtful and focused on improving the system. We would also like to acknowledge the contribution of Mr. Jack Litvack, a Winnipeg based health consultant who assisted with the interviews of patients and family members.

Finally, the Review Team would like to acknowledge the strong project administration support provided by the Deputy Minister's office by Ms. Pat Hosang. Her commitment, dedication and strong organizational skills contributed greatly to the review process.

EXECUTIVE SUMMARY

An external review of the Manitoba Cardiac Care program was undertaken at the request of Manitoba Health. The purpose of the review was to examine and make recommendations for improvements relating to: the coordination, operation and quality of all aspects of cardiac care including cardiology, cardiac surgery, anesthesiology and critical care; the coordination and management of cardiac surgery wait-lists; and the recruitment and retention of cardiac care program staff.

The Review Team has made a number of recommendations they believe are critical to set the framework for the development for an outstanding Cardiac Sciences Program in Manitoba. The reader is cautioned that the high level summary of key recommendations that follows must be interpreted within the context of the detailed information, recommendations and related rationale documented within the full report.

- The development of a patient-focused Cardiac Sciences Program should be a high priority for the government of Manitoba and the Winnipeg Regional Health Authority.
- All cardiac surgery should be consolidated at the St. Boniface General Hospital (SBGH).
- Recruitment and retention of strong and effective medical and administrative cardiac leadership must be a high priority as this is essential to the Program's success.
- Dedicated operating rooms, intensive care unit beds, ward beds and an adequate supply of trained and experienced critical care nurses must be provided for cardiac surgery at the SBGH.
- Adequate dedicated coronary care unit beds and ward beds must be provided at both the SBGH and the HSC to support the cardiology service.
- High quality cardiology services must be provided at both the Health Sciences Centre (HSC) and the SBGH.
- A Regional Cardiac Sciences Program structure with clear accountability relationships and dedicated program funding must be developed.
- Cardiac anesthesiology services should be consolidated at the SBGH and a Head of Cardiac Anesthesiology position created.
- Improvements must be made to the administrative and information management infrastructure required to more effectively monitor program quality and support research.
- Wait-list management processes must be improved and mechanisms must be implemented to more effectively communicate with patients and their families.
- There must be a strong commitment by all parties to ensure the effective implementation of the recommendations of this review; and a follow-up review should be undertaken within twelve months to evaluate progress on implementation.

Given the correct leadership in cardiology, cardiac surgery and anesthesiology, strong administrative leadership from the SBGH and HSC, and appropriate support from the Province, the WRHA, and the Faculty of Medicine, there is a tremendous opportunity in Winnipeg to develop an excellent cardiac sciences program. There are superb individuals clinically, educationally and scientifically in Winnipeg; and the critical mass of activity exists to provide top quality cardiac care in a cost-effective manner.

BACKGROUND

I. PURPOSE AND SCOPE OF THE REVIEW

The Terms of Reference provided by Manitoba Health defined the purpose and scope of the work to be undertaken by the external review team. Specifically, the review was to examine and make recommendations for improvements relating to the:

- Coordination, operation and quality of all aspects of cardiac care including cardiology, cardiac surgery, anesthesiology and critical care;
- Coordination and management of cardiac surgery wait-lists; and
- Recruitment and retention of cardiac care program staff.

The specific scope of work that was undertaken by the Team included the following:

- Review wait-times for angioplasty services in Manitoba and recommend appropriate service volumes;
- Review the indications (criteria) for angioplasty used by cardiologists in Manitoba and recommend appropriate indications;
- Review angioplasty outcomes in Manitoba and identify appropriate benchmarks;
- Review per capita cardiac surgery rates in Manitoba and recommend appropriate service volumes;
- Review the criteria used by cardiologists and cardiac surgeons in Manitoba for determining if a cardiac patient requires surgery on an emergent, urgent or elective basis and recommend appropriate criteria;
- Review how patients who are placed on wait-lists in Manitoba for elective cardiac surgery are monitored and prioritized and recommend appropriate wait-list management protocols and wait-times;
- Review why patients waiting for cardiac surgery in Manitoba are cancelled and recommend actions to reduce the frequency of cancellations;
- Review recruitment practices, staffing levels and retention rates for all cardiac staff and recommend appropriate staffing benchmarks and practices, including the appropriate numbers of cardiac surgeons for Manitoba;

- Review the availability of critical care beds to support the cardiac surgery program in Manitoba and recommend the appropriate levels of critical care;

- Review cardiac "fast tracking" in Manitoba and identify new opportunities to reduce reliance on critical care beds, particularly at St. Boniface General Hospital (SBGH);

- Review how interventional cardiology, cardiac surgery, cardiac anesthesiology, perfusionist services, cardiac nursing and related critical care services are provided across two tertiary hospitals in Manitoba and make recommendations regarding how the delivery of these cardiac services could be better structured, coordinated and managed. Specifically, critically review the management structure;

- Review cardiac surgery outcomes, including mortality rates in comparison with other jurisdictions and identify appropriate benchmarks;

- Review quality management processes for all aspects of cardiac care and recommend possible improvements; and

- Review the Winnipeg Regional Health Authority's (WRHA) plans to develop the cardiac program further, including the expansion of services and an assessment of the conditions necessary to support such a program.

II. APPROACH

The approach taken in the review involved completion of the following key tasks.

- *Initial Project Steering Committee Meeting:* An initial meeting was held with representatives from the WRHA and the Ministry to clarify project objectives and scope, review the proposed work plan and schedule, and identify key individuals to be interviewed. The meeting was also used to clarify project management procedures, including reporting relationships and communications protocols.

- *Assemble Review Team:* A Review Team, comprising representatives with expertise in cardiology, cardiac surgery, anesthesiology, critical care medicine, cardiac care nursing and clinical administration, was assembled.

- *Documentation Review:* Members of the Review Team reviewed a wide range of documents, reports and data relevant to the issues being studied. This included a review of the numerous external reviews of the program that have been conducted.

- *Initial Site Visit:* Dr. Koshal and Lawrence Beaudry conducted an initial site visit in late March to set the groundwork for a full Review Team visit in April. Initial meetings/ interviews were held with selected senior administrators from the WRHA and the Ministry.

- *Review Team Site Visit:* The Review Team conducted an on-site visit during which the majority of the key players were interviewed and other required data collected. In addition, several focus groups were conducted with front-line staff to provide broader input into the review process. Approximately one hundred physicians, administrators, nurses and other health professional staff participated in interviews or focus groups during the site visit.

- *Phone Interviews:* Review Team members utilized phone interviews to do required follow-up or to collect any additional data that they required.

- *Review of Public Submissions:* Several members of the public responded to a public invitation to submit written statements identifying issues, concerns or suggestions relating to cardiac care. These were reviewed by the Chair and utilized as an important part of the database in the development of the recommendations in this report.

- *Consultation with Patients and Family Members:* Representatives from the Review Team conducted individual interviews with ten patients or family members of patients who expressed an interest in meeting with the Team. These interviews provided significant insights into the nature of patient/family experience with the cardiac care system; and they were invaluable in shaping some of the recommendations in this report.

- *Preliminary Draft Report:* Individual Review Team members documented their findings for their assigned areas of responsibility and submitted these to the Chair for review. The Consultant consolidated these findings and recommendations into a preliminary draft report for review by the entire Review Team.

- *Team Review of Preliminary Draft Report:* The Preliminary Draft Report was reviewed by the Review Team and modifications required as a result of this review were incorporated into a revised Draft Report.

- *Steering Committee Review Draft Report:* A meeting was held with the Project Steering Committee to review the findings and recommendations. Suggestions or recommendations from the Steering Committee were discussed and considered by the Review Team before finalizing their report.

- *Final Report:* The final report was presented to the Minister of Health.

- *Report Implementation Status Review:* The Minister has committed to conducting a review of the implementation status of the recommendations in this review within one year of the completion of the report.

The Review Team relied heavily on data and information provided by the study participants. The team did not independently verify all data and statistics provided by study participants and third party reports. It is also important to emphasize that the observations and the recommendations

in this report are not prepared for the purpose of being critical, but rather to provide a constructive, comprehensive opinion which can be used to improve cardiac services within the province of Manitoba.

III. ORGANIZATION OF THE REPORT

This report is organized in three main sections:

- ***Section 1*** provides the background to the review and includes the:
  - Project purpose and scope;
  - Approach taken to complete the review; and
  - Organization of the report.
- ***Section 2*** includes the key findings organized under the following headings:
  - Cardiac Surgery;
  - Cardiology;
  - Critical Care and Anesthesiology;
  - Nursing and Patient Care Services; and
  - Patient/Public Input.
- ***Section 3*** presents the recommendations and the related rationale along with key implementation considerations.

KEY FINDINGS

I. CARDIAC SURGERY

Background

The delivery of cardiac services to the people of the Province of Manitoba, and in particular to the people of Winnipeg, has a many year history of internal conflicts and challenges. This history has been well documented in the numerous external reviews that have been conducted in the past, and will not be discussed in detail in this report.

The data upon which this section of the review is based were drawn from two major sources. A review of relevant statistics, planning documents and past external reviews was completed; and a series of interviews and meetings were held with members of the Sections of Cardiac Surgery at the HSC and the SBGH, the Section of Anesthesiology of the SBGH, the Chairman of Surgery (Dr. Oppenheimer), the WRHA leaders (Dr. Postl, Dr. Wright, Dr. Nugent and Ms. Currie), the managers of the surgery wait-list (Dr. Oppenheimer, and the Chiefs of Perfusion at both hospitals. All meetings were very informative and characterized by very open and forthright discussions.

Consistently identified in all discussions were three key elements that require immediate attention to correct the problems impacting the delivery of cardiac services in general and cardiac surgery in particular. These included: 1) the need for strong leadership, particularly in cardiac surgery; 2) the need for dedicated human and financial resources for the post-operative and intensive care management of cardiac surgery patients; and 3) the need to consolidate cardiac surgery at one site while maintaining a strong cardiology presence at both sites.

Surgical Activity Levels

The Cardiac Surgery Section provides a full range of surgical procedures for the Province except for pediatric cardiac surgery and heart transplantation. The Section provides services to approximately 1.2 million people, about 800,000 of which are over the age of 20.

Cardiac surgery services for the Province of Manitoba are delivered at two sites in Winnipeg, the Health Sciences Centre (HSC) and the SBGH. Annually, approximately 700 open heart cardiac operations are conducted at SBGH and 500 at the HSC. Based upon the current number of cases being performed – 1,200 annually with a wait-list of 110, a volume of 1,300 cases annually should meet the immediate needs of the population base being served. It is anticipated this will increase by an additional 200 cases over the next five years as operational efficiency increases and demand increases as a result of changing population demographics.

The Section is not achieving the Cardiac Care Network of Ontario (CCN) targets for coronary by-pass surgery. Likely contributing to this is the fact that there are an inordinate number of surgical cancellations. This high cancellation rate appears to be related both to wait management and the lack of dedicated intensive care beds, compounded by the shortage of critical care nurses.

The population-based minimum target rates of the CCN of Ontario per 100,000 adults aged 20 and over are as follows: 2001/02 = 104 (actual); 2003/04 = 100 (proposed); and 2004/06 = 110 per year (proposed). Manitoba should adopt the CCN rates as targets for surgical revascularization.

Surgical Staffing Levels/Recruitment

There are currently five surgeons with one surgeon on leave for professional reasons. To appropriately staff a cardiac surgery program with a case load of 1,500 open heart procedures a total of seven cardiac surgeons, including a new Chief of Cardiac Surgery, are required. At the current surgical volumes (1200-1300 cases) a total of six surgeons are required.

Cardiac Surgery Intensive Care

Currently, the surgical intensive care beds at the SBGH are under the control of the Critical Care Program; and cardiac surgery must compete with other sections for access. To correct this, there must be at least one fully equipped, staffed and dedicated intensive care bed for each 100 cardiac operations; and responsibility for the care of the patients in this intensive care unit and the management of this unit should reside with the Cardiac Sciences Program.

Morbidity and Mortality Reviews

The Cardiac Surgery Section utilizes the Society of Thoracic Surgeons (STS) database to monitor their results. However, at present there are few, if any, morbidity or mortality reviews within surgery and joint rounds with cardiac anesthesiology or cardiology are non-existent.

The WRHA has reported cardiac surgical outcomes using crude mortality and morbidity rates. This practice does provide some valuable clinical outcome data; however, presenting mortality and morbidity results that are stratified for case acuity and risk is more meaningful. This practice should be implemented immediately; and the results could be analyzed from the Institute for Clinical Evaluation Sciences (ICES) in the same way that they analyze Ontario data.

Indications for Cardiac Surgery

The cardiac surgery section in Winnipeg uses standardized criteria for classifying all patients consistent with those recommended by the CCN of Ontario. Patients having Coronary Artery By-pass Graft (CABG) procedures only, are categorized as either emergent, semi-urgent, urgent or elective. These urgency ratings are based upon an urgency score as defined by the CCN of Ontario. The URS is calculated using a regression formula developed by the CCN. It is

based upon the following: exercise ECG risk assessment; Canadian Cardiovascular Society classification; functional imaging (nuclear, thallium, perfusion scan, etc.) risk assessment; LV function; previous aorto-coronary bypass procedures; anatomy; medical status; and recent MI.

A patient with an Urgency Rating Score (URS) of greater than 5.0 is considered elective and deemed to be able to safely wait no more than 180 days. A patient with a URS between 4.01 and 5.0 is classified as semi-urgent and is assigned a Maximum Recommended Wait Time (MRWT) of 42 days. A patient with a URS equal to or less than 4.0 is classified as urgent and assigned a MRWT of 14 days. Emergent cases are cases that go directly to the operating room from the Emergency Room or the Catheterization Laboratory. They are assigned a URS of 1.

Currently, there is no formula for determining urgency rating scores for patients who are having non-CABG procedures or patients having CABGs in conjunction with other cardiac procedures. For this patient population, the surgeon and Cardiac Wait-list Coordinator make a decision on urgency rating after considering the same factors as those listed above. The WRHA has also established a maximum wait time of six months for these patients. The CCN is in the process of developing URS formulas for this patient population which should be of assistance to the Manitoba program in the future.

Cardiac Surgery Section Leadership

The long-term "acting "status of this role has limited access to the power, authority and resources necessary to improve and change the Section.

Members of the Cardiac Surgery Section all agreed that there needs to be a strong leader with the interpersonal relationship building skills and the management skills to pull the Section together.

Perfusionist Services

The reporting relationship on medical matters for perfusion services at the HSC is a joint responsibility between anesthesiology and surgery. A similar situation did exist at SBGH, but recently was altered so that perfusionists now report directly to administration on all issues. This is a source of concern to perfusionists, physicians and surgeons at SBGH and needs to be addressed.

Research and Education – Cardiac Surgery

While the focus of this external review was on clinical services, the research and educational activities of cardiac surgery need to be addressed. There were no documents indicating the extent of research activities including publications; however, the members clearly indicated that, while they recognized the importance of research, they were not equipped for this endeavor at present.

Under guidance, there is an approved Royal College Training Program in Cardiac Surgery is to be commended for maintaining a fully approved residency program under adverse conditions. He does not receive adequate resources to manage this program. Resource requirements to support the residency program include adequate access to secretarial support and funding for surgical residents to enable research activities and attendance at major conferences.

Location of Cardiac Surgery Services

While some of the tensions that have historically existed between the surgeons at the two sites have dissipated as some of the more senior surgeons have retired and younger surgeons have been recruited, delivering cardiac surgery at two sites is still problematic. It results in leadership, communication and organizational challenges; and duplication and inefficiency with neither site having the critical mass/volumes required to optimize effectiveness or resources. Moving to a one site model for cardiac surgery would go a long way to addressing some of these issues.

Analysis of the existing facilities, proposed facility re-development plans and the service plans for the SBGH and the HSC are quite instructive regarding the preferred location for a consolidated cardiac surgery service. Specifically, there are compelling arguments for consolidating cardiac surgery at the SBGH site within a *regional program framework* including the following.

- The strong focus by the HSC on trauma, neurosurgery and transplantation consumes substantial operating room, ICU and ward bed resources. A review of the facility re-development plans reveals that, even after completion of the planned construction in 2006, the HSC would not have the capacity to handle 1,500 cardiac surgery procedures without compromising other high priority services at the HSC.

- The SBGH would have the capacity to handle the total required volume of 1,500 procedures. Three operating rooms are available to support the surgical load; the SBGH has available a unit with the 37 ward bed capacity that would be required to support the service; and other modifications to critical care facilities required to support the increased surgical volumes could be completed within a relatively short timeframe.

- The hospital administration at the SBGH indicated to the reviewers that they are prepared to create a 15-bed dedicated cardiac ICU/step-down unit that would be required to support the consolidated cardiac surgery service.

- There is potential at the SBGH to establish a coronary care unit capable of looking after sick cardiac patients and a critical unit to care for surgical cases.

- Internal Medicine and subspecialty supports and consultation services are in place at the SBGH; and a sufficient number of anesthesiologists, including physicians from both the SBGH and HSC, would be available to support a consolidated surgery service. In a one-site model, cardiac anesthesiology services should be consolidated. Continued attention to the education, recruitment and retention of nursing and allied health staff will be necessary to maintain a consolidated program.

- The SBGH and HSC together have an adequate complement of well-trained, experienced nursing and allied health staff required to support a consolidated cardiac surgery service.

- Cardiac surgeons already take call and operate at both centers in Winnipeg. Most thoracic trauma is dealt with by a thoracic surgeon. On-call for cardiac trauma cases at the HSC requiring a cardiac surgeon could be readily provided by the cardiac surgeon on-call.

- A world class Cardiac Research team, led by is located on the campus as part of the SBGH Research Centre. The Clinical Research Institute is also nearing completion and will be available to support advances in clinical practice, including cardiac sciences.

- The Cardiac Services Enhancement project is proceeding on schedule – SBGH will be providing the majority of specialized cardiology services within the Region and provisions can be made to provide a dedicated coronary care unit and additional beds to support the inpatient cardiology service. In addition, the SBGH Research Foundation has made a substantial contribution to the Cardiac Enhancement Services Project.

- Senior management at the SBGH have indicated to the reviewers that they are committed to creating a centre of excellence in cardiac services and recognize its' success requires involvement of other hospitals and community agencies within the Region; they also indicated commitment to utilizing program management, envelope funding and regional health authority accountability structures appropriate to the operation of a Regional Program.

- Consolidation will put in place the key elements of leadership, clinical expertise, facility infrastructure and resources necessary to provide high quality clinical, teaching and research.

II. CARDIOLOGY

Background

The data upon which this section of the report is based were gathered from multiple interviews plus a review of relevant documents, statistics and previous reviews conducted of cardiology services in Winnipeg. Interviews were conducted with:

- Dr. Oppenheimer, WRHA Medical Director, Surgery Program;
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- Dr. Dan Roberts, WRHA, Director, Medicine Program;
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The reviewer also met with members from the WRHA leadership team, including Dr. Postl, WRHA CEO; Dr. Wright, WRHA VP and Chief Medical Officer; Dr. Linda Nugent, Program Medical Director for the WRHA Anesthesiology Program; and Jan Currie, WRHA VP and Chief Nursing Officer.

Location of Services

Currently, cardiology appears to be moving forward and developing their focus at the SBGH. While this is a positive step that has resulted in the majority of cardiology services being provided at the SBGH, it is important for cardiology not to abandon the HSC. A strong presence must be maintained there to ensure that the many patients with acute cardiac problems that present at the HSC receive top quality care.

Leadership

The Department is now attempting to recruit a new leader for the Cardiology Section. It will be very important to recruit a cardiologist with a commitment to building a strong cardiac sciences program, and the ability to forge consensus and work collaboratively with cardiac surgery, critical care and anesthesiology. This Section leader could also be considered for the position of Regional Director for a new regional Cardiac Science Program.

Recruitment

Recruitment in cardiology has been difficult over the years and continues to be a challenge. In part, this is because of problems inherent in the program. Interviewees noted that several positions are required, particularly for cardiologists who are interested in a research or educational career. Successful recruitment will occur only if there is a strong cardiovascular program in place.

Cardiac Catheterization Laboratory Activity

- *Location of Catheterization Laboratory Activity:* SBGH has been operating two Cath labs since the end of March 2002; one at ten hours per day and the other at eight hours per day. The HSC had an adult cath lab and a separate pediatric cath lab for many years. In the spring of 2002 construction began on a new cath lab to replace the existing labs. The new lab opened November 18, 2002 and is currently used 60% for adults and 40% for children.

- *Catheterization Rates:* In 2001/2002, there were 4,316 diagnostic catheterizations performed in the City. In 2002/2003, this number fell to 3,830. Assuming a catchment population of about 800,000 residents over the age of 20, this generates a crude procedure rate of 479 per 100,000 adult population, which is quite similar to the crude procedure rates of other jurisdictions in Canada. For example, Ontario's rate is 492 per 100,000 adult population.

- *Angioplasty Rates:* There were 1,313 angioplasties performed in 2002/2003 which is 164 per 100,000 population. This rate is very close to the rates in Ontario and other jurisdictions in Canada. In Ontario, the rate for 2001/2002 was 141 per 100,000 and the population base minimum target rate for Ontario 2003/2004 set by CCN is 140 per 100,000. In Winnipeg, more than 80% of the angioplasties were performed at the same time as the cardiac catheterization (so called ad hoc angioplasty); and this rate is higher than any jurisdiction in Ontario. However, this rate is not inappropriate if the required resources are in place to allow a high number of ad hoc angioplasties.

  With regard to appropriate rates for angioplasties, Ontario is suggesting a target rate of 160 per 100,000 population for 2005/2006. This would be an appropriate minimum target rate for the Winnipeg group to pursue. It should be emphasized that this is a minimum target.

- *Angiography Wait-times:* The current wait time for elective outpatient angiography is 14 days. This allows faster access than most centres in Ontario and is certainly appropriate. The inpatient wait time is 0-2 days and, again, this is superior to many centers in Ontario and certainly very appropriate. There is very little wait time for angioplasty. As noted earlier, more than 80% of these procedures are performed at the same time as

angiography; and for the remainder the waiting times are less than 2 weeks. These numbers also compare favorably to wait-times in other Canadian jurisdictions.

- *Indications for Angioplasty:* The indications used for angioplasty by cardiologists in Manitoba were reviewed. The indicators used are those recommended by the American College of Cardiology and the American Heart Association; and are the same as those used by other cardiologists working in Canada.

- *Appropriateness of Catheterizations:* There were some concerns expressed about the appropriateness for cardiac catheterization. The reviewer was assured by angiographers that when analyzed, less than 10% of the cardiac catheterization procedures demonstrated normal coronary arteries. This is a good benchmark for a cardiac catheterization laboratory, suggesting that most patients who are catheterized have significant disease, warranting investigation.

- *Cath Lab Outcomes:* A review of Cath Lab outcomes for Manitoba revealed that good records are kept of cardiac catheterization complications. From January 1, 2002 to December 31, 2002, these complications were in line with other large catheterization laboratories. Complications included a death rate of 0.1%, only two strokes and other complications that fall within the range of complications recorded by other jurisdictions. The Cardiology Section is attempting to improve measurements of outcomes with the APPROACH Database which is specifically designed to track Cath Lab outcomes. To date, there has been a significant problem around personal health information legislation and perhaps some lack of computer and infrastructure support. This is an important initiative worthy of support for the future monitoring of outcomes in the cardiac catheterization laboratory.

- *Referral Processes:* During the review, concerns surfaced regarding the process used to refer patients into the cardiac catheterization laboratory. All outpatient coronary angiography must be requested or screened and approved by a member of the section of cardiology. This referral process starts with a referral form. Direct request from family physicians or non-cardiology specialists are distributed to the invasive cardiologist for approval. All inpatient requests are screened by the cath lab booking staff or brought to the attention of an invasive cardiologist. There was strong concern expressed by some of the cardiologists that patients were not adequately worked up prior to arrival in the cardiac catheterization laboratory. In many jurisdictions, a triage nurse follows these referrals from outlying hospitals, becomes aware of the clinical situation, arranges transfer to an in-hospital service and ensures adequate documentation has been sent prior to referral. This ensures proper work up of the patient prior to cardiac catheterization. This system works very well, although it does require committed beds for transfers. This problem, if generic, needs to be corrected by a system change.

- *Patient Records:* There is also concern about information technology. Many of the cardiologists suggested implementing an electronic patient record would be an important direction for improving patient management.

Echocardiography

There is an inappropriate eight month waiting list for echocardiography in Winnipeg. This problem needs to be addressed. Although there is a triage system in place to make sure that urgent echocardiograms are done expeditiously, this is too long a wait for patients. The primary problem appears to be a shortage of qualified technologists. Wait times for stress-MIBI examinations should not exceed one month. This is an important area that needs to be addressed by the developing cardiovascular program

Inpatient Service

There is a lack of dedicated facilities for cardiology services. There needs to be a dedicated coronary care unit of adequate size to look after not only routine cardiac problems but also complicated cases. Inotropic support, ventilation and counter pulsation balloons need to be inserted in the coronary care unit under the care of cardiologists. In Winnipeg, there is a questionable relationship with critical care whereby patients who require more intensive therapy are transferred from one service to the other. This is not conducive to good patient management and it is inappropriate for education. As indicated in previous reviews, there needs to be dedicated beds for the coronary care unit, step-down and ward care. In addition, the practice of having nurses rotate between the intensive care unit and the coronary care beds should be re-examined in favor of having dedicated cardiac nurses in the coronary care unit.

There needs to be appropriate coronary care unit beds at each site to support the acute cardiac program. It is suggested that 12 to 16 beds will be required at the SBGH and 8 to 10 beds at the HSC, where it will be important to maintain a strong cardiac presence.

Outpatient Service

The outpatient facilities continue to be inadequate. Our understanding is that there are plans in place to make facility enhancements that will address this issue; but, for the present, adequate space is lacking. On the positive side, electrophysiology has been a real advance for the program and is now well established. This needs to be supported.

Education

Issues identified relating to medical education included the lack of dedicated training positions from the Department of Medicine; and the concern that the educational experience in the coronary care unit does not include adequate continuity of care for extremely ill patients with cardiac conditions. The cardiovascular program would be strengthened significantly by guaranteed training positions and the recommended improvements to inpatient coronary care.

Research

Clearly, research is not a priority for the Section of Cardiology. In part, this is because of an excessive clinical load in the face of limited personnel and resources. This needs to be a high priority for a new program with dedicated resources committed for the recruitment and support for clinical scientists, who can bridge the gap between a well-developed basic science program and the clinical service area. It is strongly suggested that the new head of cardiology have either strong research credentials or be strongly supportive of research.

Relationships With Other Key Programs/Services

Effective delivery of cardiology services are dependant upon close working relationships with other programs and services within the Region. Issues and concerns identified relative to these relationships include the following.

- *Cardiac Surgery:* One of the most significant problems identified is the major ongoing conflict between cardiology and cardiac surgery. There appears to be very little respect demonstrated between these two Sections and this lack of cooperation limits cardiovascular growth and development.

  It will require strong leadership and improved communication to rebuild the trust between the two Sections necessary to maintain a successful cardiac sciences program.

- *Critical Care:* There is a sense from the cardiologists that there needs to be more autonomy from the critical care department with dedicated coronary care unit beds and the ability to appropriately treat acute cardiac patients with ionotropic support, counter pulsation balloons and ventilation as required.

- *Department of Medicine:*

  He suggested that communication had been a very difficult area and was slowly improving. He indicated support for a cardiovascular program, provided there was strong leadership in place; and emphasized the importance of strong communication skills as an important quality for the new leader.

- *Anesthesiology:* It is important to recognize that tertiary care cardiology is becoming increasingly dependant upon an excellent anesthesiology service. This is particularly important in complex electrophysiology anesthesiology where it is a critical ingredient to delivering quality care.

III. CRITICAL CARE AND ANESTHESIOLOGY

Background

This section of the report is based on a review of documents provided by the WRHA relating to Cardiac Care services, a site visit, conducted in mid-April, and interviews conducted with physicians and staff prior to, during and subsequent to the site visit. Physicians and staff interviewed included:

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This section of the report will focus on issues relating to the provision of cardiac anesthesiology, critical care services and quality management processes relating to the aforementioned areas. WRHA cardiac surgery services are provided at two sites: HSC and SBGH. Total caseload between the sites is approximately 1,200 cases per year with approximately three-fifths of the cases being performed at SBGH. Two distinct physician groups, who have adopted their practice patterns to accommodate ICU resources available within their respective institutions, provide anesthesiology services.

SBGH

At SBGH, patients are transferred from the operating room to a surgical intensive care unit, which is located in a designated area within a larger recovery room. From viewing the physical space, it was apparent that the surgical intensive care unit was not purpose-built, but rather adapted to the available recovery room space. There are no designated/protected intensive care beds for cardiac surgery patients.

In the recent past, elective cardiac surgery cases have been cancelled due to lack of surgical intensive care unit bed availability. Recently, through the artifice of decreasing nursing staff on the weekend, thereby shutting down surgical intensive care unit beds, and increasing staff at the beginning of the week allowing surgical intensive care beds to open, elective cardiac surgery cancellations at the beginning of the week have been reduced or almost eliminated.

Patients in the surgical intensive care unit are cared for by physicians attached to the Critical Care Program. There is 24-hour, in-house medical coverage of this unit. Following discharge from the surgical intensive care unit, patients are transferred to a cardiac surgery step-down unit. This step-down unit is inadequate. It is excessively small, lacks effective air conditioning, and other basic amenities that should be standard in a tertiary care hospital care area. The configuration is conducive to cross infection and severe logistical difficulties should more than one patient require emergency resuscitation. Medical coverage of the step down area is provided by surgical staff. However, there is no in-house, 24-hour coverage of this area. The provision of 24-hour coverage for the step-down areas is a priority that should be addressed.

Patients are subsequently transferred from the step-down area to the ward, if adequate nursing staff is available on the ward.

HSC

The paradigm of care at the HSC differs from that provided at SBGH in that patients are transferred from the operating room to the recovery room where they are cared for by an attending anesthesiologist until they are extubated (no longer require mechanical ventilation) and considered hemodynamically stable. This level of care in the recovery room is achieved by having a cardiac anesthesiologist available to provide medical supervision in the recovery room. Eighty percent of elective patients meet the criteria of extubation and hemodynamic stability and are transferred to a step-down unit. This step-down unit is a modern purpose-built facility with a nurse to patient ratio of 1 to 2. Patients remain in this step-down unit for a period of approximately 36 hours before discharge to the ward. There is dedicated medical coverage available for the step-down unit.

Patients who fail to meet the criteria of extubation and hemodynamic stability after a six-hour period are transferred to the surgical intensive care unit. In the HSC, as in SBGH, medical coverage in the intensive care unit is provided by the Critical Care Program. There are no dedicated cardiac surgery beds at HSC. There is extreme pressure on surgical intensive care unit beds at HSC as it is a busy trauma center and has a very active neurosurgical program.

The Chronic Pain Service at the HSC has developed an innovative nationally recognized program to offer alternatives for patients with severe inoperative coronary artery disease. Currently, funding for seven spinal cord stimulation devices per year is provided and to date stimulators have been implanted in 38 patients. An FDA trial is underway to evaluate these stimulators in the US, and Winnipeg is the lead site for the trial. Subject to confirmation of positive results from the FDA sponsored trial, expansion of the program should be considered a priority.

Medical Staff at both sites, both in anesthesiology and in intensive care medicine, appear to be of very high caliber and provide an excellent standard of care in their respective areas.

Critical Care and Anesthesiology - Major Issues

- *Communication:* Significant communication challenges were identified during the review.
  - Communication between the regional administration and physician leaders in anesthesiology and intensive care appears to be very limited. Individuals involved in day-to-day care of patients at both sites do not feel part of the decisions made by the Region with respect to cardiac care.
  - No structure exists for cardiac anesthesiologists, surgeons, intensive care unit physicians, and administrators to meet on a Region-wide basis to discuss issues of concern and plan program developments.
- *Intensive Care Resources:* Major issues and concerns relating to intensive care resources include the following.
  - At both sites, intensive care unit resources available to the Cardiac Surgery Program are limited and influenced by external factors out of the control of the Cardiac Sciences Program.
  - The early extubation patient management system, developed at the HSC to meet the volume demands of cardiac surgery in the absence of adequate intensive care unit support, is highly innovative and offers the promise of altering the paradigm of care immediately post-operatively for patients undergoing cardiac surgery. The adoption of this model, however, requires the availability of a cardiac anesthesiologist in the postoperative recovery room, recovery room staff training in the management of cardiac surgery patients, and an appropriately equipped and staffed step-down unit.
  - Despite the success of the HSC program, it is apparent that there are inadequate ICU beds at both sites dedicated to cardiac surgery services. Intensive Care bed availability is a factor not only of patient demand from other services, but also the availability of nurses trained in intensive care medicine.
  - The current infrastructure and configuration of intensive care unit facilities at both sites and the step-down unit at SBGH is sub-optimal. Telemetry for cardiac surgery patients on the ward is limited.
- *Leadership:* Leadership issues and challenges identified included the following.

- Anesthesiology leadership is site-based rather than regional in nature. The individuals occupying leadership positions are extremely well trained and innovative in their outlook. Excellent anesthesiology care is provided to cardiac surgery patients at both sites. Unfortunately, due to the communication issues outlined above, the full potential of the anesthesiology human resource capital is not being realized.

- There is a lack of overall Cardiac Sciences Program leadership, and this deficit affects the attitudes and the processes of all aspects of the Cardiac Sciences Program.

Quality Assurance: Leadership, organizational and resource related issues within the Cardiac Sciences Program have created an atmosphere that is not conducive to fostering an interest in quality assurance. These factors, combined with the lack of integration across sites and between surgeons, cardiologists, anesthesiologists, and intensive care unit physicians caring for cardiac surgery patients, has resulted in inadequate quality assurance monitoring. Major issues and concerns relating to quality assurance practices include the following.

- At SBGH, there are no joint anesthesiology, intensive care unit, and cardiac surgery morbidity and mortality rounds. A similar situation exists at the HSC.

- The regional quality assurance system in place appears to those involved in direct patient care as a top-down process; and there is little confidence in the information obtained through this program.

- The cardiac surgeons within the Region enter their information on the STS database, but this information is no longer shared with other individuals, such as anesthesiology, intensive care, and intensive care physicians who play a key role in patient management.

- There are no uniform standards of care developed by the surgical service and the perceived lack of cooperation between individual surgeons makes quality management difficult.

- Both cardiac anesthesiology groups have carried out quality audits to address specific concerns. Within the Critical Care Program, weekly case conferences occur; but there is limited interplay between the intensive care physicians and the cardiac anesthesiologists and surgeons.

- Should a cardiac surgery patient die while under the care of the Intensive Care Program, an exchange of letters occurs but no formal Mortality and Morbidity Conferences are convened. An ICU outcome database exists, but this also is not

shared with anesthesiology and surgery. It is used to assess resource utilization and for research purposes.

- *Equipment:* Transesophageal echocardiography is an integral component of the intraoperative and postoperative care of patients having cardiac surgery. The Winnipeg Region is fortunate in that it has attracted individuals within both cardiac anesthesiology groups who are skilled and proficient in echocardiography. One individual at SBGH is cross-appointed to the echocardiography laboratory within the Section of Cardiology where he also provides clinical diagnostic echo services. Adequate equipment is available to provide appropriate intraoperative and postoperative echocardiographic services currently. However, machines currently in use will require upgrading in the near future.

IV. NURSING AND PATIENT CARE SERVICES

Background

Sessions were held with over seventy staff from the WRHA, SBGH, and the HSC to gather information regarding strengths, challenges and issues relating to the delivery of cardiovascular patient care services. Participants included regional and site program directors, program managers, clinical nurse educators, nurse clinicians, resource nurses, physiotherapists, physicians, staff nurses and the wait-list coordinator. Clinical areas represented within the groups included the pre-admission clinic, operating room, post-anesthetic recovery room, surgical intensive care unit, medical intensive care, cardiovascular/thoracic step-down, post-operative surgical wards, day surgery, ambulant care clinics, and the cardiac catheterization laboratory.

Program Strengths

A number of regional and hospital-based initiatives were identified as having impacted positively on the delivery of cardiovascular services including the following.

- *Regional Initiatives:* Positive regional developments and initiatives include:
  - The approval by the Minister of the recommendations of the *"Cardiac Services Enhancement Project"* will have a positive impact on service delivery;
  - A sub-program director for cardiology was created, supported by an authority-wide clinical nurse specialist and data-analyst;
  - A cardiology technology review was conducted in 2002 to consider management information system needs; and
  - A joint critical care program between SBGH and HSC (affiliated with the University of Manitoba) prepares nurses to work in ICU and on step-down units.

As of March 2003, 19 nurses graduated from this program and 12 more will be graduating in July.

- *SBGH Initiatives:* A number of specific practices have been implemented at the SBGH which support effective service delivery including:

  - Two operating room nurses are exclusively assigned to do cardiac work;
  - Nurses working in the step-down unit must have a year's experience and must take advanced assessment classes;
  - There is a one to two week orientation program for nurses working on the general wards;
  - Quality improvement initiatives are occurring in the surgical intensive care unit (SICU).Medical leadership in this area is provided by the clinical director of the unit;
  - Formal communication structures exist within the Surgery Program at the SBGH, among the nursing and allied staff including a Leadership Committee comprised of managers, resource nurses, and educators;
  - Initiatives to improve flow through SICU are underway; e.g., fast-tracking vascular patients. Currently, 50% of cardiac surgery patients are extubated within six hours; and
  - Cardiovascular thoracic (CVT) nurse clinicians practice in advanced practice roles, doing histories and physical examinations, and the ordering of diagnostic tests and medications.

- *HSC Initiatives:* Specific practices or initiatives at the HSC that were viewed positively included:

  - The rapid recovery (fast-track) program for cardiac surgery was seen as an efficient mechanisms for handling 80 to 90% of the elective patients;
  - A well-resourced cardiac surgery step-down unit is in operation (2:1 staffing ratio, no ventilators, CVT associate, after-hours house staff, clinical assistant);
  - He appears to be highly valued, doing histories and physicals, and ordering selected diagnostic tests and medications on all cardiac surgery patients (Pre-admission Clinic [PAC] and inpatients);
  - Triage rounds are held weekly to review all patients on the HSC wait-list;

- A Regional Wait-list Coordinator has been appointed who is responsible for contacting all patients who are on the elective wait-list at both hospitals at least on a monthly basis, and communicating directly with cardiac surgeons;

- The majority of cardiac surgery patients (90%) are admitted the day of surgery after going through the pre-admission clinic (PAC); and

- There is some participation by cardiac sciences physicians and staff in clinical research.

Challenges and Issues

A number of Region-wide and hospital-based issues and concerns relating to the organization and delivery of cardiac patient services were identified including the following.

Regional – Challenges

- There are challenges associated with having cardiac sciences split between the Regional Medical Program and the Regional Surgical Program. Delivering services on multiple sites is also a challenge given that the regional program directors and sub-directors have no direct authority on the sites. These problems are exacerbated by a lack of physician leadership in both cardiology and cardiac surgery.

- Recruitment and retention of staff in several health care disciplines related to cardiac sciences continues to be a challenge. Attracting and retaining specialist physicians, medical leaders and specialist nurses (OR, CCU and ICU) must be a high priority.

- Communication between the departments of cardiology and cardiac surgery needs to be improved significantly.

- The "*Cardiac Enhancement Project Proposal (1998)*" did not address the significant increase in pacemaker volumes.

- The "*Cardiology Technology Review (2002)*" did not address authority-wide clinical technology needs and/or opportunities; e.g., exercise stress and Holter monitoring systems.

- The joint SBGH/HSC critical care program has capacity for more students. It is anticipated that the WRHA needs to graduate at least 40 nurses per year to meet ongoing critical care needs.

SBGH – Challenges

- Many participants perceived SBGH as not wanting to be a part of the WRHA, and being unwilling to collaborate or share resources. Examples cited included the SBGH

changing its bed map without notifying the WRHA; and the SBGH purchasing a new telemetry system for the step-down unit and refusing to let the regional clinical nurse specialist sit on the Procurement Committee. These issues are not uncommon in Canada in situations where acute care services are provided by faith-based hospitals that operate under contractual relationships with regional health authorities. However, these challenges must be effectively addressed if the SBGH is to have operational responsibility for delivering regional programs.

- In addition, cardiac surgeons have control of their own wait-lists and may change the slate with very little notice resulting in "scrambling" by staff to have unprepared patients ready for surgery.

  It is not mandatory for cardiologists and surgeons to participate in the wait-list management process; this needs to be changed.

- There are no dedicated cardiovascular intensive care unit (CVICU) beds. Beds are identified informally, but not officially. Insufficient numbers of critical care beds is the main reason for cancellations at the SBGH site. Frequent cancellations of cardiac surgery cases do occur; there was evidence that some patients had been cancelled up to 3 to 4 times.

- Cardiac intensive care (CCU) patients are treated in the medical intensive care unit by intensivists; therefore, cardiologists must turn over the care of their critically ill patients (balloon pumps, invasive monitoring). This reduces the cardiologists' ability to practice to their full scope.

- There is a shortage of cardiac clinical assistants for the operating room and there are not enough CVT clinicians to meet the needs.

- The patient to nurse staffing ratio in cardiac surgery step-down unit is too high. At the SBGH, it is 3:1; whereas, it is 2:1 at HSC.

- Information and technology systems need to be improved. There is inadequate access to computers for many staff.

- There is no "on-call" cardiac surgery nursing team for emergencies. Only one cardiac operating room nurse is on-call; therefore, she must often work with another OR nurse who is not familiar with these types of procedures.

- Length of time between a patient's visit to the cardiac pre-operative clinic and their operative date may be extensive (sometimes over a year); therefore, tests results are sometimes no longer valid. The hospital does not make effective use of the PAC to reduce the length of stay.

- There is no consistent medical coverage for CVT on off-hours. SICU has after hour coverage, but the step-down units and wards do not. Surgeons are on-call for their own patients.

- The area designated for SICU and surgical step-down is less than ideal. Capital improvements to climate and infection control are necessary to reduce risk.

HSC – Challenges

- The cardiac catheterization laboratory is frequently underutilized at HSC. This may be in part attributable to the fact that the laboratory was closed for six months during the previous year. Since re-opening, utilization levels are increasing. It must also be recognized that the cath lab is required to support the Children's Hospital (on the same site) and adult services for cardiology patients presenting at the HSC. The HSC also provides cardiology (pacemaker) and diagnostic services to the Children's Hospital.

- There are frequent surgical cancellations due to emergencies, changes in patients' condition pre-operatively, or long cases.

- The current space and facilities at the HSC are marginal for existing levels of cardiac surgery, let alone any increase in volume. The proposed site re-development, scheduled for completion in 2006, will not be adequate to handle a consolidated cardiac surgery program and still meet other program needs.

- There is no clinical nurse specialist for cardiac sciences at this site; and there is no replacement for the CVT associate when he is away.

- Currently, only one cardiac surgeon is practicing from the HSC site (one surgeon from SBGH only picks up OR time at HSC).

- There is no call schedule for the clinical assistant (surgical assist) for cardiac surgery. This causes numerous operational issues due to one cardiac surgeon at the HSC for emergencies.

- CVT associates practice in advanced roles in accordance with medical directives; however, these directives are not reviewed and reaffirmed regularly (no review for 2 to 3 years).

- There are low volumes and a very short wait-list for cardiac surgery at HSC (approximately 2 weeks from PAC to surgery); this often results in "scrambling" for patients and last minute changes to the slate.

V. INPUT FROM PATIENTS AND THE PUBLIC

Background

To round out the data collection process, an opportunity was provided for interested patients, families of patients and members of the public at large to provide input into the review. A public advertisement, which appeared twice in the Winnipeg Free Press, the Brandon Sun and Manitoba weekly newspapers, elicited ten responses from individuals who requested interviews. Nine of these were interviewed by a sub committee of the Review Team; one did not keep their appointment. In addition to those interviewed, seven written submissions were made, some of which were supported by telephone conversations with Dr. Koshal.

Observations

Several verbal or written submissions expressed positive feelings regarding their experiences with the cardiac care system in Manitoba. Positive comments made by this grouping of respondents included expressions of satisfaction with:

- The results of the cardiac surgery on their health and quality of life;
- The cardiac surgeon;
- The surgical team and related staff for their expertise and understanding;
- The quality of care received; and
- The responsiveness of the medical team.

Several of the individual interviews and written submissions noted concerns about the cardiac care services including:

- Communications problems between WRHA administration, physicians and staff involved in the delivery of cardiac care and patients and their families; and support for a more open system of communication regarding the dissemination of information to patients and their families
- Long wait-times for surgery or cardiology care ;
- Questions about who is accountable for patient follow-up and monitoring, when a patient is placed on the cardiac surgery waiting list;
- Dissatisfaction with the quality of care provided or the surgical outcome achieved;
- Support for increased public access to clinical outcomes data; and

- Support for a transparent and objective processes to evaluate the performance of physicians and cardiac surgeons.

The patients and family interview process and the review of written submissions were very useful and revealing. The interviewees were polite, honest and open and appreciated the opportunity to tell their stories; and the written submissions were thoughtful and constructive. Although the number of respondents was small, they did provide valuable insights into some of the program's strengths as well as perceived shortcomings.

In those instances where negative experiences were encountered, the most common theme appeared to be a lack of a formalized and standard communication processes. It is very important that patients and their families, on the one hand, and their care givers, program leaders and WRHA representatives on the other, are able to engage in open and without-prejudice discussion in a frank and honest manner. Open and candid communication processes are critical in resolving some of the problems that were outlined to the Review Team during the interview process.

RECOMMENDATIONS

REGIONAL PROGRAM STRUCTURE AND LEADERSHIP

1. ***Regional Cardiac Sciences Program:*** *Establish a Regional Cardiac Sciences Program in Winnipeg with the main centre of operations being at the SBGH.*

   Comment: This program must be among the highest priorities for the Province. The Regional Health Authority, the HSC and the SBGH must provide adequate dedicated facilities, human resources and equipment necessary to make this a top-notch referral centre. There are compelling advantages to creating a single cardiovascular program from a service quality, operational effectiveness, efficiency and academic perspective. The proposed program structure would enhance the ability of the Region to attract high quality leadership, substantially reduce fragmentation, facilitate improved communications, and create the critical mass of cardiovascular activity necessary to deliver high quality, cost-effective services.

2. ***Regional Program Medical Director:*** *Immediately recruit a Regional Program Medical Director responsible for both the clinical and academic mandates of the Program.*

   Comments: The Regional Program Medical Director must be capable of bringing together cardiac surgery, cardiology and anesthesiology into a cohesive program. This individual needs excellent communication skills and needs to be grounded in clinical care with a strength and/or understanding of what is needed to build a strong academic program. This individual **must** be either a cardiac surgeon or a cardiologist.

   The Cardiac Sciences Program must be approved and supported before recruitment proceeds, in order to make the position attractive for the "best and the brightest". This recruitment should be completed immediately so that the new Regional Program Director can be involved in the implementation of the recommendations of this report. The Regional Program Medical Director would also serve as either the Chief/Head of Cardiac Surgery or the Chief/Head of Cardiology, depending upon his/her area of specialization.

   The Regional Program Medical Director would be accountable to the Vice President Medical – WRHA for the overall clinical program direction and coordination; and to the Site Medical Directors for SBGH and the HSC for the management of day-to-day medical issues impacting their respective sites. For academic matters, the Medical Director would also have a reporting relationship to the Dean of the Faculty of Medicine, through the Chair of Surgery for cardiac surgery and through the Chair of Medicine for cardiology.

3. ***Program Leadership Team:*** *Establish a Regional Cardiac Sciences Program leadership team, comprising the Regional Program Medical Director and a Patient Services/Administrative Director.*

<u>*Comment:*</u> This model contemplates a close working relationship between the Regional Program Medical Director and the Patient Services Director with both involved in program planning, budgeting, operations, expenditure control and clinical quality control. The Patient Services Director would have primary responsibility for all matters relating to the recruitment, deployment and supervision of nursing and other allied health professionals, as well as responsibility for the day-to-day administration of the program. The Patient Services Director should have dual accountability to the Regional Program Medical Director and WRHA Vice President Nursing.

An Executive Committee, chaired by the Regional Program Medical Director should also be established that includes the Chief of Cardiology, the Chief of Surgery, the Chief of Anesthesiology, the Patient Services Director, the Cardiac Sciences Research Director and the triage nurses from both hospitals. This Committee would be involved in program planning and resource allocation decisions and meet regularly to identify and resolve issues and concerns.

4. ***Accountability Relationship:*** *The SBGH would be directly accountable to the WRHA for the operation of the Regional Cardiac Sciences Program. This accountability relationship must be carefully structured in a detailed service contract that includes clear direction regarding the:*

- *Mechanisms and processes to allow key stakeholders (WRHA, Faculty of Medicine, SBGH, Research Institutes) to have significant input into the program design, ongoing monitoring and evaluation;*
- *Volume of activity/services that are to be provided;*
- *Dedicated resources that are to be provided to support the Cardiac Sciences Program on the SBGH site;*
- *Provisions to deal with significant unanticipated changes in service demands and annual volume adjustments;*
- *Communications protocols;*
- *Issues/disputes resolution mechanisms;*
- *Quality Management Program, which should include clear performance measures, quality indicators and processes to identify and resolve issues relating to quality; and*

- *Financial accounting procedures that ensure that dedicated program funds are being expended on the Cardiac Sciences Program.*

Comment: Given the distinct corporate status of the SBGH, it will be important to define clearly the roles, responsibilities, interdependencies and accountabilities of the key stakeholders whose collaboration and cooperation will be essential to the success of this provincial program. It will also be critically important to ensure that the Program is adequately funded and that the dedicated resources are being utilized to deliver the specified contracted services and not re-directed to other programs or services.

5. ***Dedicated Program Funding:*** *Establish a dedicated envelope of funding (operating and capital) that provides sustainable long-term support for the Cardiac Sciences Program.*

Comment: In order to effectively position the Cardiac Sciences Program as a "premier" provincial program, predictable long-term funding is required. This allows the stakeholders to demonstrate their respective commitments to the Program; and it facilitates effective strategic and operational planning.

6. ***Cardiac Sciences Council:*** *Establish a Cardiac Sciences Council with representatives from the medical and nursing disciplines involved in the care of cardiac disease.*

Comment: The Cardiac Sciences Council would serve as a forum to identity issues, improve communications and provide advice regarding future program directions.

7. ***Research Infrastructure:*** *Provide adequate resources and infrastructure to support cardiac sciences research.*

Comment: The new Program must have resources to support cardiovascular research and facilitate integration with the research centre. The new Regional Program Director must have reasonable access to and ability to direct these resources.

CARDIAC SURGERY

8. ***Consolidate Cardiac Surgery:*** *Consolidate all cardiac surgery at the SBGH site combining the best of practices from both the HSC and SBGH models.*

Comments: The optimal approach to the provision of cardiac surgical services including preoperative, intra-operative, and postoperative care would be facilitated if such activities were consolidated at a single site. Consolidation would also create the critical mass (1200+ per year) necessary to achieve optimal operational efficiency and cost-effectiveness in the delivery of surgical services. Consolidation would support improved wait-list management and increase the alignment between the high quality research currently being conducted in cardiac sciences with clinical care.

There are compelling reasons for consolidating cardiac surgery at the SBGH site which are detailed earlier in this report. These include:

- The strong focus by the HSC on trauma, neurosurgery and transplantation consumes substantial operating room, ICU and ward bed resources. A review of the facility re-development plans reveals that, even after completion of the planned construction in 2006, the HSC would not have the capacity to handle 1,500 cardiac surgery procedures without moving other high priority services out of the HSC.

- The SBGH would have the capacity to handle the total required volume of 1,500 procedures. Three operating rooms are available to support the surgical load; the SBGH has available a unit with the 37 ward bed capacity that would be required to support the service; and other modifications to critical care facilities required to support the increased surgical volumes could be completed within a relatively short timeframe.

- The hospital administration at the SBGH indicated to the reviewers that they are prepared to create a 15-bed dedicated cardiac ICU/step-down unit that would be required to support the consolidated cardiac surgery service.

- The hospital administration is also prepared to change the current Critical Care Configuration to accommodate the needs of the Cardiology Program.

- Internal Medicine and subspecialty supports and consultation services are in place at the SBGH; and a consolidated cardiac anesthesiology group will provide a sufficient number of anesthesiologists to support a single-site surgery service.

- The SBGH and HSC have an adequate complement of well trained experienced nursing and allied health staff required to support a consolidated cardiac surgery service.

- Cardiac surgeons already take call and operate at both centers in Winnipeg. On-call for the occasional cardiac trauma case at the HSC could be readily provided by the cardiac surgeon on-call at the SBGH.

- A world class Cardiac Research team, led by , is located on the campus as part of the SBGH Research Centre. The Clinical Research Institute is also nearing completion and will be available to support advances in clinical practice, including cardiac sciences.

- The Cardiac Services Enhancement Project is proceeding on schedule – SBGH will be providing the majority of specialized cardiology services within the Region and provisions can be made to provide a dedicated coronary care unit and additional beds to support the inpatient cardiology service. In addition, the SBGH

Research Foundation has made a substantial contribution to the Cardiac Services Enhancement Project.

- Senior management at the SBGH have indicated to the reviewers that they are committed to creating a centre of excellence in cardiac services and recognize its' success requires involvement of other hospitals and community agencies within the Region; they also indicated commitment to utilizing program management, envelope funding and accountability structures appropriate to the operation of a regional program.

- Consolidation will put in place the key elements of leadership, clinical expertise, facility infrastructure and resources necessary to provide high quality clinical, teaching and research.

9. ***Cardiac Transplantation:*** *Surgical and post-operative care for any planned future cardiac transplantation services should be located at SBGH.*

Comments: The natural evolution of the cardiac surgery program should include the provision of cardiac transplantation services. These services should be included in the proposed consolidation of cardiac surgery at the SBGH.

The future addition of cardiac transplantation services at SBGH should not impact other transplant related services on the HSC site. I.e., the transplant-related Lab and other services now located at the HSC should remain on-site in order to continue to support the established lung, kidney and bone marrow transplant services.

10. ***Operating Rooms:*** *Designate three operating rooms for cardiac procedures required to handle the volume of cases.*

Comment: An efficiently run operating room can handle approximately 500 procedures annually. To manage the projected volume of 1,500 cases, three operating rooms will be required.

11. ***Ward Beds****: Make provisions for up 37 dedicated cardiac surgical ward beds, the capacity required to handle up to 1,500 cases.*

Comment: Dedicated ward beds to support the cardiac surgery program should be directly managed by the newly proposed Cardiac Sciences Program. The general standard for the determination of need for ward beds is 2.5 beds per dedicated cardiac surgery ICU bed. Assuming 15 ICU beds, 37 ward beds would be required. This could be phased in depending upon the volume of cases being managed.

12. ***Recruit Section Head:*** *Recruit a new Head for the Section of Cardiac Surgery.*

Comment: If the Regional Program Medical Director is a cardiac surgeon, this individual should also serve as the Head of Cardiac Surgery. In the event that the Regional

Program Medical Director is a cardiologist, a new Head for Cardiac Surgery should be recruited as soon as possible.

Recruitment into both the cardiology and cardiac surgery head positions should be done as quickly as possible, since these individuals should be actively involved with the implementation of the recommendations of this review. Heads of these two sections need to work closely to dispel sectional rivalries that have been so destructive in terms of morale and efficient utilization of resources.

Significant resources will have to be made available to attract the appropriate people to a City with such a long-standing history of discord in the delivery of cardiac services. Compensation rates must be competitive to ensure that high quality candidates are attracted to the position.

13. ***Perfusion Services:*** *Ensure that perfusion services within cardiac sciences report on medical matters to the medical leadership of cardiac surgery and anesthesiology.*

Comment: Perfusionists should be responsible directly to surgery and anesthesiology for all clinical matters. This will help to ensure effective communication about and resolution of any issues relating to clinical quality.

CARDIOLOGY

14. ***Recruit Section Head:*** *Recruit a new Head for the Section of Cardiology.*

Comment: In the event that the new Regional Program Medical Director is a cardiac surgeon, a new Section Head for cardiology should be recruited as soon as possible. See comments relating to recommendation 12.

15. ***Cardiology Service Location:*** *The majority of cardiology activity should continue to be focused at the SBGH, but a strong cardiology service must be maintained at the HSC.*

Comment: Given the fact that the HSC will continue to treat a large number of patients with acute coronary problems, any concentration of cardiac care at SBGH must not reduce the ability of the HSC to meet the needs of its patients.

16. ***Coronary Care Units:*** *A dedicated coronary care unit, under the direction of the Cardiac Sciences Program, should be established at the SBGH site to monitor and treat extremely ill cardiology patients; as well plans should proceed, as detailed in the "Critical Services Redevelopment Project," to have ten funded CCU and ten telemetry beds at the HSC site.*

Comment: There needs to be dedicated coronary care units of adequate size to look after not only routine cardiac problems but also complicated cases. Inotropic support, ventilation and counter pulsation balloons need to be inserted in the coronary care units

under the care of cardiologists. All CCU beds should be under the direction and control of the proposed Cardiac Sciences Program. In the CCU, cardiologists should be responsible for patient care and consult critical care medicine specialists in complex cases as needed.

Cardiology cannot be expected to grow and flourish when a coronary care unit is made up of a few beds at the end of an ICU. In addition, the practice of having nurses rotate between the intensive care unit and the coronary care beds should be changed in favor of having dedicated cardiac program nurses in the coronary care units.

17. ***Interventional Cardiology:*** *Develop a cost-effective model for interventional cardiology that meets the needs of the HSC and Children's Hospital.*

Comments: The migration of the majority of interventional cardiology procedures to the SBGH has not been without some challenges. Notwithstanding, the majority of cardiac catheterizations should continue to be done at SBGH. The challenge is to find the right balance between the volume of activity at each of the sites and the allocation of equipment and staff resources while still ensuring the quality of care.

It is clear that, in order for the HSC to meet the needs of the many patients with acute coronary problems that are treated at the HSC, cardiac catheterization laboratory services are required at the site. The HSC currently operates one lab including a 0.6 adult component with no after-hours service and a 0.4 pediatric component. If utilization and volumes increase, consideration could be given to adding a second lab at an appropriate time in the future to provide for 24 hour adult coverage and enhanced pediatric services.

18. ***Cardiac Catheterization Referrals:*** *There should be a triage nurse at both sites in charge of handling cardiac catheterization laboratory referrals.*

Comment: The triage nurses should be charged with responsibility for communicating with the referring hospital and physicians and communicating to patients any change in status on the waiting list. With the help of designated physicians within each institution, these individuals should make appropriate referrals directly to the cardiac catheterization laboratory or to dedicated hospital services for evaluation and therapy prior to cardiac catheterization. These individuals are as important as the triage nurses presently employed by the surgical Sections. They should also work closely with cardiac surgery and be available to cross-over.

19. ***Adequate Bed Base:*** *The WRHA must dedicate adequate beds to the cardiology program including, coronary care unit, step down and ward beds. These beds should be directly managed by the newly proposed Cardiac Sciences Program.*

Comment: These dedicated beds are necessary to support the level of clinical activity and provide a consistent high standard of cardiology care.

20. ***Education Support**: The Department of Medicine should ensure dedicated positions for cardiology resident and fellowship training.*

21. ***Technical Support:** Adequate resources are required to support the technical services including the echocardiography program; and improved information technology support is required.*

INTENSIVE CARE RESOURCES:

22. ***Early Extubation Management Program:** The early extubation management program, as practiced at HSC, should be incorporated into the consolidated program at the SBGH.*

    Comment: The utilization of the early extubation management program will have positive resource implications for the program. As nursing staffing requirements are a key driver of cost in intensive care and of bed availability, the universal applicability of the early extubation model should facilitate the efficient functioning of the dedicated cardiovascular/step-down unit by allowing appropriate adjustments in the nurse-patient ratio. Appropriate recovery room and medical staff resources should be made available to facilitate this recommendation.

23. ***Dedicated Cardiac ICU/Step-down Unit**: Establish a dedicated cardiovascular intensive care/step-down unit at the SBGH site, under the direction of the proposed Cardiac Sciences Program, to support the consolidated cardiac surgery program*

    Comment: All cardiac surgical ICU/Step-down unit beds should be directly managed by the newly proposed Cardiac Sciences Program. Variability in length of stay makes prediction of step-down/ICU bed requirements an inexact science. In general, most centers plan on having available one ICU bed for every one hundred cases performed annually. If the Region demand is anticipated to be 1,500 open heart cases, then the supporting step-down/ICU bed infrastructure for cardiac surgery should be approximately 15 beds. This recommendation is contingent upon the continuance of the early extubation management program currently practiced at HSC.

24. ***ICU Staffing:** Cardiac anesthesiologists and cardiac surgeons trained in intensive care medicine should be encouraged to participate in the staffing of the ICU/Step-down unit. The development of a relatively small group of intensive care physicians dedicated to providing service in the cardiovascular ICU/Step-down unit should be encouraged.*

    Comments: The development of an interdisciplinary group responsible for the ICU/Step-down unit will improve overall care of cardiac surgery patients and facilitate improved communication and interdisciplinary research.

ANESTHESIOLOGY SERVICES

25. ***Cardiac Anesthesiology Section:*** *Create a single Cardiac Anesthesiology Section (Sub-Program) under the leadership of a Section Head. The Cardiac Anesthesiology Section Head would have a reporting relationship to the Medical Director for the existing WRHA Anesthesiology Program and the Regional Program Director for the newly formed Cardiac Sciences Program.*

Comment: The Section should meet on a regular basis, under the chairmanship of the Section Head, to provide a forum for discussion and the development of procedures and practices related to the ongoing development of cardiac anesthesiology service delivery within the Region.

26. ***Section Head:*** *Establish a funded position for a Section Head of Cardiac Anesthesiology and move to recruit into this position immediately.*

Comment: The individual occupying this position should develop policies and procedures directed at establishing a unified approach to the provision of cardiac anesthesiology services within the Region. Responsibilities will include assessing human resource needs, developing training standards, encouraging interdisciplinary research and maintaining competence requirements as they relate to individuals providing cardiac anesthesiology within the Region.

27. ***Consolidate Cardiac Anesthesiology Services:*** *Consolidate cardiac anesthesiology services at the SBGH. Anesthesiologists at the HSC, who wish to continue to provide this service, should be given the opportunity to integrate into the Regional Program at SBGH.*

Comments: Cardiac anesthesiology in the past has been resistant to the amalgamation of cardiac surgery and anesthesiology to one hospital. Historically, many reasons had been provided for this reluctance; however, the reviewers could find no sound reason to delay this action. For example:

- The HSC's functions of transplantation center, a neurovascular surgery centre and a trauma centre for Manitoba could be managed by maintaining cardiopulmonary by-pass capacity at the HSC and having a perfusionist and cardiac surgeon on call.

- The 400-500 cell saver runs per year for trauma and major blood loss could be done by a perfusionist on call or an appropriately trained anesthesiology technologist.

- For patients presenting at the HSC with acute cardiac illness, angioplasty, intra-aortic balloon pump capabilities and other interventional cardiology services will be available at the HSC; and patients that require cardiac surgery can be

transported within ten minutes to the SBGH site. This has been the practice at other non-cardiac surgical hospitals such as the Royal Alexandra Hospital in Edmonton.

- The presence of the Cardiovascular Research Institute on the SBGH site will provide additional opportunities for anesthesiologists to pursue research interests.

- Any innovative anesthesiology techniques developed at the HSC can be further developed within the unified cardiac program. The successful fast track program that cardiac anesthesiology has developed at the HSC offers great potential for increased efficiency in the proposed consolidated surgery program.

28. ***Chronic Pain Program:*** *Maintain the Chronic Pain Program for cardiac patients at the HSC. Support for this Program should be maintained and the program should be represented appropriately within the Regional Cardiac Sciences Program.*

Comments: There is no logistical reason to move the chronic pain services from the HSC; however, it is important that integration of these services within the Cardiac Sciences Program is achieved to ensure optimal patient care and facilitate interdisciplinary research.

QUALITY ASSURANCE

29. ***Quality Assurance Officer:*** *A Quality Assurance Officer position for Cardiac Sciences should be created.*

Comment: A subcommittee of the Cardiac Sciences Program should assume responsibility for developing the roles, responsibilities, and projects assigned to the Quality Assurance Officer. The Chairman of this subcommittee should report to the Cardiac Sciences Program Council at least bi-annually on ongoing quality management of the Cardiac Sciences Program.

30. ***Morbidity and Mortality Reviews:*** *Conduct morbidity or mortality reviews within surgery and cardiology as a standard of practice; and collect and present medical and surgical mortality data on a risk-adjusted basis that accounts for levels of acuity of illness.*

Comment: At present, there are few, if any, morbidity or mortality reviews within cardiac surgery. For mortality rates to be meaningful, they must be presented on a "risk-adjusted" basis, a practice that should be implemented immediately and could be analyzed from ICES in the same way that they analyze Ontario data.

31. **Joint Rounds:** *Cardiology, cardiac anesthesiology and cardiac surgery and intensive care medicine should have combined rounds on a scheduled basis to discuss matters of mutual interest.*

Comments: Currently, interdisciplinary rounds do not occur. Such activity is essential to ensure quality of patient care and to facilitate interdisciplinary communication and research.

32. **Physician Assessment:** *Establish a standardized process for assessment and evaluation of physicians and surgeons working in the Cardiac Sciences Program.*

Comments: The WRHA has established a formal regional performance review process for all medical staff. This process is somewhat generic in nature and Programs are strongly encouraged to adapt this review process to meet the needs of their specialty areas. The Review Team strongly supports the utilization of clear and standardized processes and mechanisms that are tailored for assessing physician performance in cardiac sciences. Evaluations should be completed on a regular basis and be based upon objective criteria relating to technical and surgical performance, clinical outcomes achieved and input from patients regarding their experience with the cardiac care system. Contributions to teaching and research should also be part of the evaluation as well as the ability to work in a multi-disciplinary team setting.

NURSING AND PATIENT CARE SERVICES

33. ***Wait-list Management:*** *Standardize definitions and methods of collecting data relating to wait-times for cardiac procedures; require all surgeons to enter/provide needed wait-list management data; and set internal benchmarks for mortality rates on the wait-list, based on existing experience and that of other cardiac centres.*

Comment: It is important to have common definitions, data collection procedures and targets based upon best practice benchmarks. This facilitates more effective prioritization of cases and monitoring of wait-times; it helps to improve communication with patients; and it supports more effective mitigation of risks to patients and the Region. Effective wait-list management is also dependent upon surgeons working collaboratively with the Wait-list Coordinator.

34. ***Wait-list Monitoring and Bumping:*** *Establish a formal process to ensure that patients on the cardiac surgery wait-list are appropriately monitored. This should include utilizing standard wait-listing criteria established by qualified clinical leaders; and regular contact with wait-listed patients to inform them of their place on the wait-list and to determine their current health status. Patients on the wait-list, who have been bumped as a result of the need to deal with a more urgent case, should be scheduled for the next available surgical slot.*

Comments: It should be clear to the public that there is a process whereby they can access information on wait-list times and referral procedures. This openness and transparency would go a long way to re-establishing the public's confidence in the new system.

With the provision of adequate resources, the need to bump cardiac surgical cases will be substantially reduced. However, some bumping of cases will still inevitably occur as a result of the need to deal with more urgent cases. Patients who have been bumped should be given higher priority on the wait-list and ideally they should be done on the next available surgical slot.

35. ***Communications with Patients/Families:*** *Establish an effective communication process to ensure that patients and their families are provided with accurate and timely information in response to their enquiries, including the steps that will be taken to remedy any complaints and their problems.*

Comments: Other cardiac centres in Canada utilize a number of patient care coordinators who greatly facilitate these communication processes and contribute to high levels of patient satisfaction. This option should be explored for Manitoba.

It is also critical that complaints and issues be dealt with in a timely and objective manner. This is fundamental to sound public relations, customer service and continuous improvement. Consideration could be given to the creation of a Patient Ombudsman position to provide an independent channel for dealing with patient concerns.

36. ***Human Resources Plan:*** *Develop and implement a comprehensive human resource plan to meet the current and future needs of the Cardiac Sciences Program.*

Comment: This will require clear identification of human resources required to support the development of a strong vibrant cardiovascular program in Winnipeg. Specific areas to be addressed must include: medical leadership, cardiologists, cardiac surgeons, researchers, OR, CCU, and ICU nursing staff and clinical assistants.

37. ***Pre-operative Clinic:*** *Improve the efficiency of the pre-operative clinic to increase the proportion of patients who are admitted the day of surgery.*

Comment: Not all surgeons utilize this service. Currently, only about 24% of patients at the SBGH are admitted the same day of surgery. A reasonable benchmark is that 90% to 95% of patients should be dealt with in a pre-admission clinic, thus allowing them to be admitted on the day of their surgery. This practice removes the need to occupy a bed for a day before surgery. Effective utilization of the service could significantly improve operational efficiency and reduce the length of stay for some surgery patients.

38. ***Data Management:*** *Improve the process of data collection and reporting by developing a centralized database that includes booking and wait-list management information for cardiac sciences.*

Comment: Effective clinical and administrative information systems are required to support cardiac services. Physicians, nursing and administrative staff need timely access to high quality patient data and information to support sound clinical and administrative decision-making.

39. ***Equipment:*** *Develop a capital equipment plan to meet the needs of the Cardiac Sciences Program.*

Comment: An inventory of existing equipment should be completed and an assessment done of the Capital equipment required for the proposed Cardiac Sciences Program. Equipment needs should be prioritized and an appropriate capital equipment acquisition strategy should be developed, approved, funded and implemented. This strategy should be developed in consort with facility redevelopment initiatives.

OTHER RECOMMENDATIONS

40. ***Staff Transition Support:*** *Make adequate provisions to assist HSC physicians and staff cope effectively with the transition from the HSC to SBGH.*

Comment: The HSC has a skilled, competent surgical team whose years of expert service and dedication to the healthcare system in Manitoba must be recognized and protected by fair and equitable human resource processes.

41. ***Critical Services Development Project:*** *Ensure that the consolidation of cardiac surgery at SBGH has no impact on the Critical Services Development Project and the HSC.*

Comment: The operating suites, intensive care units and emergency department in this Project will provide the overall capacity necessary for the HSC to fulfill its mandate as Manitoba's flagship tertiary facility. These new clinical facilities have been carefully scoped and flexibly designed to accommodate a variety of surgical futures at HSC involving different case-mixes and variable concentrations and consolidations of sub-specialty surgical activities between HSC and other acute care facilities in the Winnipeg Region.

42. ***Manitoba Trauma Centre:*** *Perfusionist and cardiac surgical on-call service should be provided at both the SBGH as well as the HSC.*

Comment: Cardiac surgery is not required at the HSC for the HSC to maintain its role as Manitoba's Trauma Centre. However, the ability to provide cardiopulmonary by-pass services at the HSC on an on-call basis is essential to support the occasional trauma

case and the lung transplantation program. This would also allow cardiac trauma patients to be dealt with effectively at the HSC if required.

IMPLEMENTATION CONSIDERATIONS

Successful development and implementation of the proposed Cardiac Sciences Program will be dependant upon a number of key factors including the following.

- ***Commitment to Action:*** This program has been reviewed extensively over the years with very similar recommendations to those in this report emanating from these reviews. The creation of an integrated cardiac sciences program, the consolidation of cardiac surgery at one site and the need for strong leadership are recurring themes. A decision needs to be made to proceed with the implementation of the key recommendations and immediate action must be taken to advance the agenda. The commitment made by the Minister of Health to conduct a review of the implementation status of the recommendations in this report within one year of the completion of the review should be of assistance in this regard.

- ***Leadership:*** Resources and energy must be committed to attracting the right leadership for cardiac surgery, cardiology and anesthesiology. Successful recruitment will occur only if potential candidates are convinced that the Province, the Health Authority and the Faculty of Medicine are prepared to provide the direction and support needed to turn the proposed Cardiac Sciences Program into a centre of excellence. Strong medical leadership must be complemented with strong program/nursing and administrative leadership.

- ***Investment:*** While the recommendations made in this report will optimize the use of existing physical infrastructure, it must be recognized that significant investments must be made in developing the required dedicated Cardiac Intensive Care/step-down Unit and Coronary Care Units. Integration of the outpatient clinic activity and education space will also be required. Investments will also be required in equipment and information technology to support clinical care, data management and the clinical quality monitoring program.

- ***Accountability and Funding Framework:*** The recommendations relating to the accountability framework and dedicated program funding are critical. The accountability framework for the Cardiac Sciences Program must reflect the regional nature of the program and the need to effectively engage the key stakeholders in a meaningful and ongoing way in program planning and monitoring. The Program will not succeed if it is operated in isolation from the larger Health Region, the Faculty of Medicine or the HSC. Similarly, funding must be targeted to the Cardiac Sciences Program with effective accounting mechanisms in place to ensure that expenditures are aligned appropriately with program goals and service priorities.

- ***Implementation Planning:*** It will also be important to plan effectively for program implementation. This could be supported by the creation of an implementation planning team under the direction of the CEO, WRHA, with representation from SBGH, the WRHA, the HSC, other community hospitals, the Faculty of Medicine and Manitoba Health. The Program Medical Directors for Surgery and Medicine should also be members of the implementation planning team since their advice during the transition period and their longer-term involvement and support will be critical to success. This team would be responsible for establishing the Program's goals, service mandate/activities, the implementation work plan and schedule and resource requirements.

Given the correct leadership in cardiology, cardiac surgery and anesthesiology, strong administrative leadership from the SBGH and appropriate support from the Province, the WRHA, and the Faculty of Medicine, there is a tremendous opportunity in Winnipeg to develop an excellent Cardiac Sciences Program. There are superb individuals clinically, educationally and scientifically in Winnipeg; and the critical mass of activity exists to provide top quality cardiac care in a cost-effective manner. What is required is commitment to action, support and some key individuals capable of fitting the important pieces of the puzzle together.